Cybernet

ImageTwo RC

X2-RC

Service Manual

Contents

Features

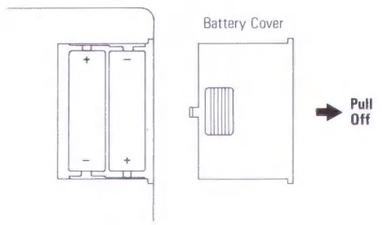
Cybernet model X2-RC is a remote control transmitter which duplicates almost all functional controls, with convenience and simplicity of the Image-II with Remote Control system. It features the following:
Pulse-modulated infrared beam system.
2 infrared diodes used.
Operates from 2 dry cells ('AA' size, 1.5V) for continuous 10 hours of operation.
Compact design to conform to Image-II with Remote Control system.

Handling Care

The transmitter should be treated with the care normally accorded to electronic equipment.
Avoid any severe shocks to the unit.
Do not remove cover – there are no user serviceable parts inside.
Do not expose the unit to excessive dust, moisture or direct sources of heat or sunlight.
The unit should not be used in the kitchen, bathroom, or in a damp basement.
If the transmitter is treated with reasonable care, the only maintenance likely to be needed for the unit is the replacement or recharging of the batteries when necessary.
Never expose batteries to excessive heat.

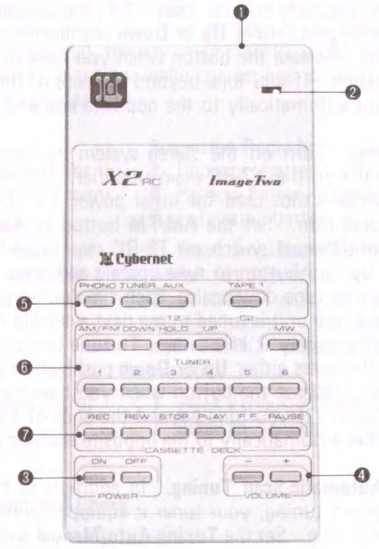
Battery Installation

The detachable back plate of the transmitter covers the compartment which is used to house 2 battery cells in parallel. Detach rear battery cover as illustrated to install batteries as shown.



Do not leave batteries in the unit when it is not being used for a long period of time. Chemical action of weak or exhausted batteries may cause a leak and result in possible damage to battery holder contacts in the compartment.
Nickel Cadmium Rechargeable Batteries. Rechargeable batteries, although higher in intial cost than other types, should be considered as an investment and in the long run, are definitely less costly since they can be recharged hundreds of times. To charge batteries, use a battery charger specifically recommended by the battery manufacturer. It is a good idea to recharge nickel cadmium batteries for a few hours when first installing them in the transmitter as they may have lost some of their charge during shipment from factory.

Function of Controls



1 Transmitting Window. 2 infrared diodes which send remote controlling signals are located inside this window. Care should be taken not to block this area by obstacles, or the transmitter operation will be very poor.
2 Battery/Operation Indicator. Indicates battery condition. Also twinkles while depressing the pushbuttons to transmit remote control commands.
3 Power On/Off Pushbuttons. After depressing the main amplifier power switch to On, use these buttons to control power On/Off from a remote location.
4 Volume Control Pushbuttons. These buttons are electronic volume controls to permit adjustment of volume for the left and right channels from a remote location. During pressing these pushbuttons, the manual volume on P2-RC is rotated by the built-in motor. Depress + button to increase the volume; depress – button to decrease the volume.
5 Program Selector Pushbuttons/Aux/Phono/Tuner/Tape 1. Selects the program source to be listened to through the stereo system from a remote location.
Aux. Selects the output of program source connected to the P2-RC preamplifier auxiliary input jacks.
Phono. Selects the output of stereo turntable connected to the **Phono** input jacks on P2-RC.
Tuner. Selects the output from T2-RC tuner.
Tape 1. Selects the output from C2-RC cassette deck.

6 Tuner Control Pushbuttons. Pushbuttons in this area will serve to control the T2-RC tuner from a remote location.
AM/FM. Selects AM or FM band.
Down/Up/Hold. When the **Tuning-Auto/Manual** switch on the T2-RC tuner is set to **Auto**, these pushbuttons will start the automatic-scan either upscale or downscale. When the **Tuning-Auto/Manual** switch is set to **Manual**, each time depressing either pushbutton will tune the T2-RC tuner to the next available station assignment. **Hold** pushbutton is used when automatic-scanning.
MW/1-6. Used for automatic memory pushbutton tuning on AM or FM. Each of 6 pushbuttons may be preset to both AM and FM stations.
7 Cassette Deck Control Pushbuttons. Determine the mode of operation of the tape transport and associated electronics from remote location. **Pushbuttons are inoperative unless a cassette tape** is loaded in C2-RC.
Play/Rewind/Fast-Forward. Depressing any of these pushbuttons will directly select the assigned tape mode. **Play:** Puts the tape in forward motion for playback of prerecorded tapes, and also should be depressed when recording program material.
Rewind: Winds the tape at high speed from the left reel to the right reel, and permits rapid return to the previous sections of the tape for replay or to start a new recording. **Fast-Forward:** Winds the tape from the left reel to the right reel at high speed, permitting you to advance the tape rapidly forward to skip sections of undesired program materials. Since a certain period of time is automatically allowed before the mechanism is engaged to next mode, you will not have to depress the **Stop** button between switching to another tape transport mode. **Record:** Used to activate the record funtion. To prevent accidental erasure or undesired recording, recording function can only be engaged after the mechanism is released from any other tape mode. To record, the **Record** pushbutton must be used in conjunction with the **Play** pushbutton in order to start the tape, and be sure to depress the **Record** pushbutton first, the **Play** pushbutton next. The recording condition will be automatically disengaged when either of the **Stop, Fast-Forward,** or **Rewind** pushbutton are depressed during recording.
Pause. Depressing this pushbutton will stop tape movement during recording or playback, but will leave the **Record** and/or **Play** button energaged so that the deck is ready to resume recording or playback as soon as the **Pause** pushbutton is pressed again.

Battery Check

The Operation indicator can be used for a handy battery checker when the transmitter pushbuttons are operated. When the indicator glows brightly, battery voltage is normal. Faint glow indicates battery voltage is on the border line and if rechargeable batteries are used, they should be recharged. Dim glow indicates battery voltage is low and batteries should be replaced or fully recharged.

Power On/Off From Remote Control Transmitter

To turn on the Image-II wth Remote Control system, first plug the power cord into the wall outlet, and depress the power switch on the A2-RC main amplifier. The remote control transmitter is inoperative and all pushbuttons on it will have no effect on the stereo system at all (even though the Operation indicator on the transmitter will twinkle). To turn off the Image-II with Remote Control system, from the transmitter, depress the **Power-Off** pushbutton. This enables you to turn off the stereo system, while keeping the switch on the A2-RC main amplifier locked in position (the power indicator above the main amplifier' power switch should go off). You can use the remote control **Power-On** pushbutton to turn on the stereo system again. To turn on the stereo system again without using the transmitter, first release the power switch on the main amplifier, then simply depress it again.

Tuner Remote Control Operation

With the Image-II with Remote Control system properly installed, proceed as follows (For operating details of the tuner, please refer to T2-RC Operation Manual):

FM Tuning. Turn on the stereo system by depressing the power switch **On** on the A2-RC, main amplifier. The transmitter's power switch is not used for intial power on. Depress the **Tuner** pushbutton. Set the AM/FM button to **FM**. Set the **Tuning-Auto/Manual** switch on T2-RC rear panel to **Manual**. Press the **Up** pushbutton to tune upscale and press the **Down** pushbutton to tune downscale. Each time either pushbutton is depressed, the unit is tuned to the next available FM station assignment precisely 50 kHz away. To tune upscale or downscale rapidly, press either **Up** or **Down** pushbutton and hold it in position. Release the button when you have tuned to the desired station. If you tune beyond the ends of the scale, the unit returns automatically to the opposite end and continues.

AM Tuning. Turn on the stereo system by depressing the power switch on the A2-RC main amplifier. The transmitter's power switch is not used for intial power on. Depress the **Tuner** pushbutton. Set the **AM/FM** button to **AM**. Set the **Tuning-Auto/Manual** switch on T2-RC rear panel to **Manual**. Press the **Up** pushbutton to tune upscale and press the **Down** pushbutton to tune downscale. Each time either pushbutton is depressed, the unit is tuned to the next available AM station assignment precisely 9 kHz away. To tune upscale or downscale rapidly, press either **Up** or **Down** pushbutton and hold it in position. Release the button when you have tuned to the desired station. If you tune beyond the ends of the scale the unit switches automatically to the opposite end and continues.

Remote Automatic-Scan Tuning. In addition to the manual remote station tuning, your tuner is equipped with the automatic-scan tuning. Set the **Tuning-Auto/Manual** switch on the rear panel of T2-RC to **Auto**. Press the **Up** button or **Down** button. The tuner will scan to a station and pause on it for 5 seconds. If you choose to continue listening to that station, depress the **Hold** button. If the **Hold** button is not depressed within 5 seconds, the unit will scan to the next station. Be sure to press the **Hold** button if you choose to continue listening to that station. To rapidly scan tune from station to station, press the **Up** or **Down** button for each change.

Memory Pushbutton Tuning. Each of 6 preset pushbuttons may be preset to an AM station and an FM station for automatic pushbutton tuning (6 AM/6 FM; 12 in all). Set the **AM/FM** button to the desired position. Adjust the **Up** or **Down** pushbutton to tune to the desired station. Press the **MW** pushbutton. Now the word **Memory** should appear on the frequency display area on T2-RC. (This is to indicate that the tuner is ready to accept presetting the station memory.) Depress any of 6 pushbuttons. (Now the word **Memory** should disappear.) Repeat above steps for each pushbutton. You may later use a pushbutton to select the station you wish to hear, by merely depressing it. **If you failed to depress the pushbutton within 5 seconds after MW pushbutton is depressed, depress the MW pushbutton again.**

Remote Tape Deck (C2-RC) Operation

Playback. Turn the stereo system on as instructed in the Remote Tuner Operation. Depress the **Tape 1 (C2-RC)** Pushbutton. Set the Dolby* NR switch and Tape Selector switch on the C2-RC preamplifier as required. Depress the **Play** button. To stop playback, depress the **Stop** pushbutton. If you want to stop playing temporarily, depress the **Pause** button. This will keep the unit ready for immediate resumption of playing. When one side of the cassette has been played, turn the cassette over if you want to play the opposite side.

Recording. Turn the stereo system on as instructed in the Remote Tuner Operation. Load the C2-RC cassette deck with a blank cassette (or a cassette with undesired program material). Set the desired Program Selector pushbutton on the transmitter which selects the source you intend to record from. Make appropriate Tape Selector selection on C2-RC. Depress the **Pause, Record** and **Play** pushbuttons successively, to lock the mechanism in record mode. Adjust the **Recording Level** control on C2-RC for proper recording level. If the **Play** pushbutton is depressed earlier than the **Record** pushbutton is depressed, the recording condition cannot be engaged in the unit. Release the pause by depressing the **Pause** button again. Now the deck commences recording. If you wish to temporarily stop recording (to omit a commercial on FM, for example), simply depress the Pause pushbutton. This will keep the unit in the recording mode ready for immediate resumption of actual recording as soon as the **Pause** button is depressed again. To stop recording completely depress the **Stop** pushbutton. If you wish to playback the recording you just have made, depress the **Rewind** pushbutton to rewind the tape deck. To record the other side of the cassette, unload the mechanism, turn the cassette over and reload. Proceed again as above. At the end of playback or recording, the machine will shut off itself.

*** TM Dolby Laboratories.**

Trouble Shooting Guide

The following guide is intended as an aid in correcting problems you may encounter when setting up the stereo system. Although suggested remedy might seem quite elementary, it may be sufficient to make corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Transmitter will not operate – no indicator light.	**1** Improper battery installation. **2** Reverse battery polarity. **3** Exhausted battery in unit.
Transmitter will not operate – indicator lights up.	**1** Main amplifier (A2-RC) power switch not depressed. **2** Obstacles interrupting infrared signals between transmitter head and P2-RC preamplifier sensor window.
Poor remote control operation.	**1** Weak exhausted batteries in unit. **2** Same as 2 above.

Measurement and Check

1. Measurement condition

1) Reference temperature: 25°C
2) Reference humidity: 65%
   NOTE: Unless otherwise specified, alignment may be performed under the room temperature of 5 – 35°C and the room humidity of 45 – 80%.
3) Power supply
   Use regulated power supply of 0V – 12V DC range, unless otherwise specified.

2. Test equipment

All test equipment to be used in this alignment should have its known accuracy and capability to operate within a range of specified tolerance described in the electrical specifications. All test equipment to be used should be properly calibrated.

a) Synchroscope: 0.5 mV – 50 Vp-p measurable. 20 Hz – 20 MHz.
b) Frequency counter: 100 Hz – 1 MHz.
c) Regulated DC power supply: 0 – 12V DC.
d) DC current meter: 0 – 500 mA.

3. Measurement and check

This remote control transmitter will require no adjustments. Be sure and check following items.

3.1 Booster transformer voltage check.
1) Set the 2 AA size batteries to the remote controller.
2) Connect synchroscope probe to diode D-1 cathode side.
3) Check the voltage should be within DC 12 – 14V when depressing each transmitting mode pushbutton.

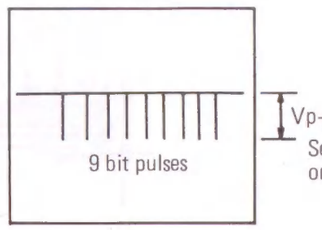
3.2 Transmitting pulse check.
On above condition, check Q-3 collector voltage should be more than 3 Vp-p (negative pulse).

3.3 Transmitting current check.
1) Transmitting current drain should be less than 40 mA.
2) Current drain on non-transmitting condition should be less than 3 μA.

3.4 Operation indicator check.
Operation indicator will wink while depressing any of transmitting mode pushbuttons. When releasing, winking should not occur.

3.5 Inferior supply voltage operation check.
1) Apply DC 3V by DC regulated power supply instead of the batteries.
2) Depressing any of transmitting pushbuttons, reduce power supply voltage by 2V.
3) Check no failure will occur when reducing power supply voltage 3V – 2V.
   Important: Power supply voltage shall not be more than 3.5V.
4) Transmitting pulse p-p voltage:

Check by synchroscope



See following on next page

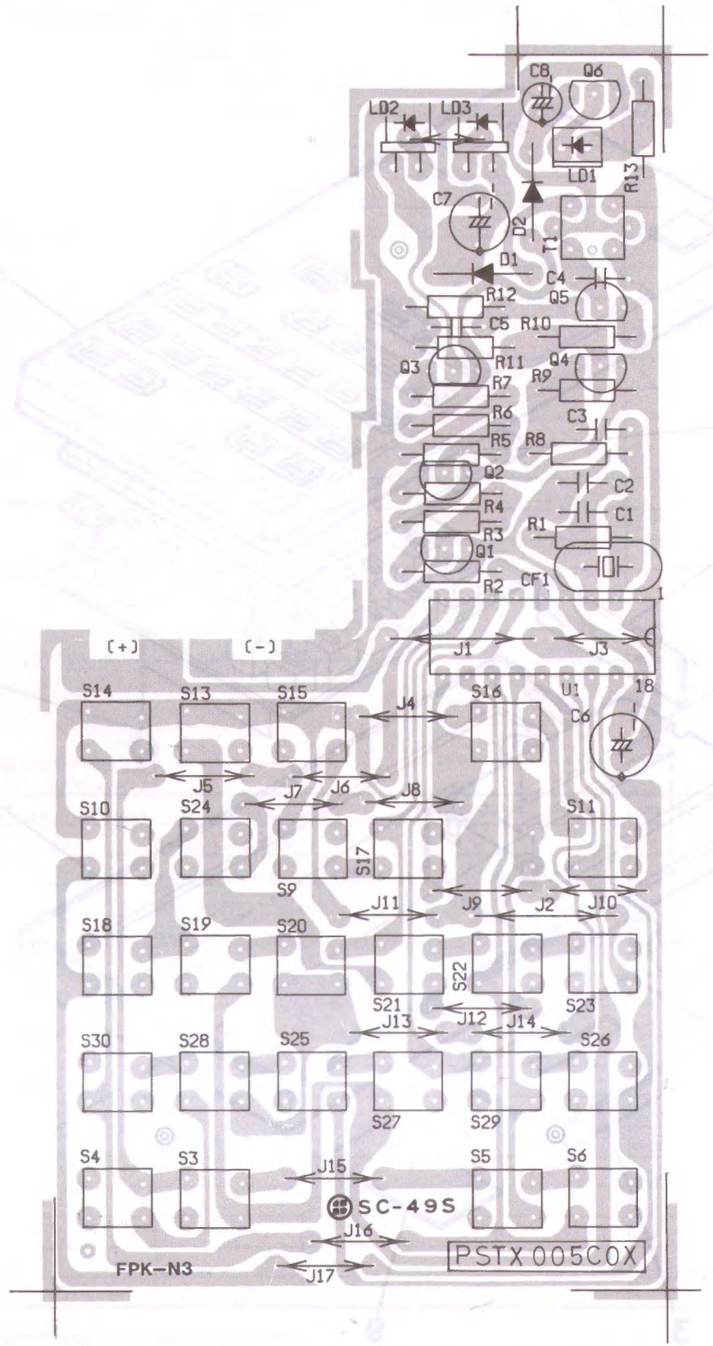
Power supply	D-1 cathode voltage	Q-3 collector voltage	Q-3 pulse p-p voltage	Current drain
3.5V	17V ± 1.5V	15V ± 1.5V	3.8V ± p-p	45 mA ± 5 mA
3.0V	14V ± 1.5V	13V ± 1.5V	3.8V ± p-p	35 mA ± 5 mA
2.5V	10.4V ± 1.5V	9.4V ± 1.5V	3.5V ± p-p	25 mA ± 5 mA
2.0V	7.0V ± 1.5V	5.8V ± 1.5V	3.2V ± p-p	15 mA ± 5 mA

3.6 Reference (clock) frequency check.

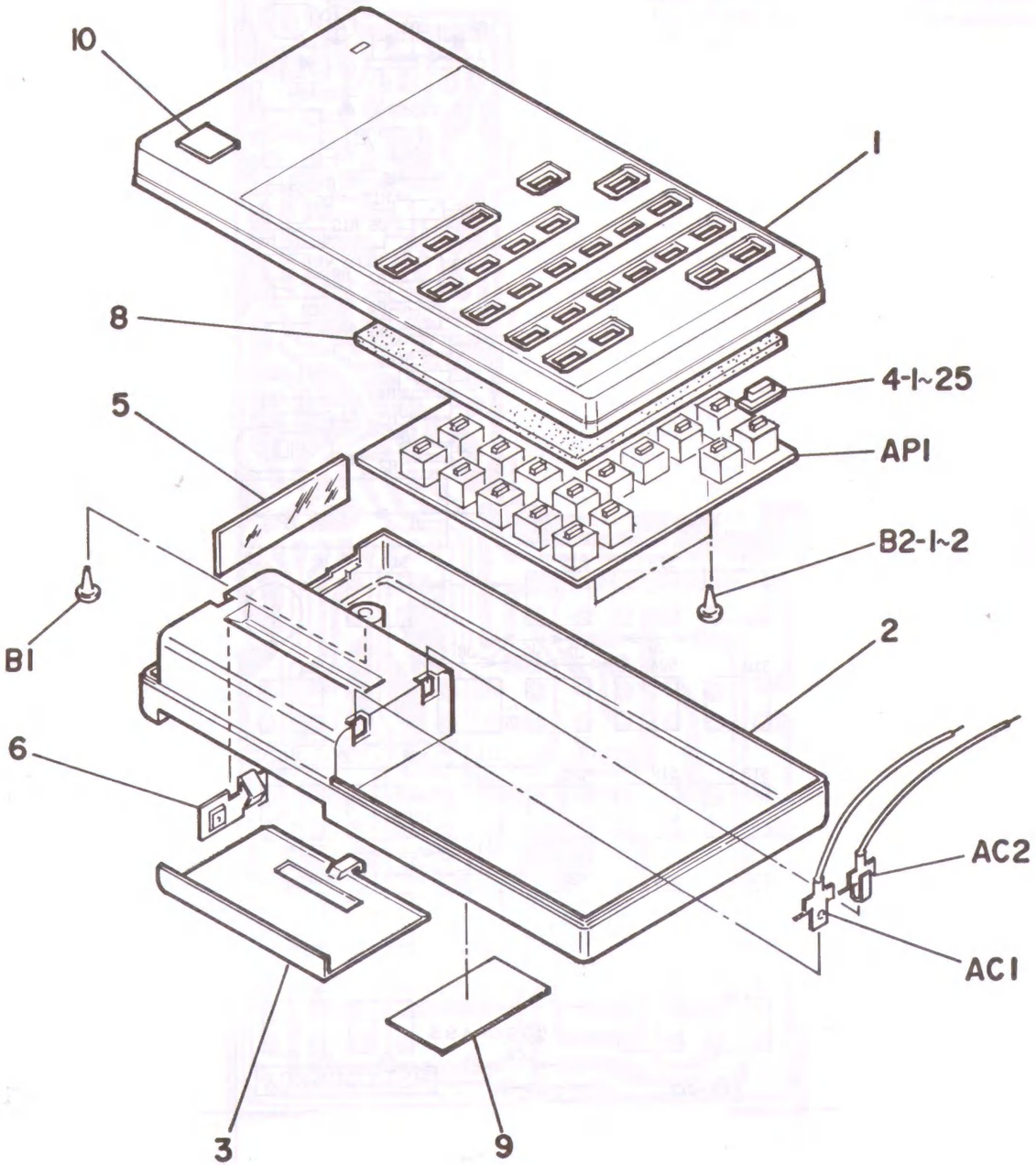
1) Connect frequency counter to #2 or #3 pin on IC-1.
2) Check reference (clock) frequency should be 455 kHz ± 2 kHz.

NOTE: If the difference the 2 clock frequencies (receiver and transmitter of 455 kHz) is greater than 10 kHz, malfunction of remote operation will occur.

PC Board Layout



Exploded View



Replacement Parts List

EXPLODED ASSEMBLY	PART NAME: ELEC. ELEMENTS	PART CODE: YRT05AUCAL1					
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
1	EXPLODED	APSTX005AA		P.W.BOARD ASSY			1
2		YHB130101Z		BATTERY HOLDER		AC1	1
3		YHB130102Z		BATTERY HOLDER		AC2	1
4							
5							
6							
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21							

EXPLODED ASSEMBLY	PART NAME: MECH. ELEMENTS	PART CODE: YRT06ASMCL2					
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
1	EXPLODED	AMX2RC**01		FRONT CASE ASSY		1	1
2		BTPP2608AN		PAN TAP SCREW	+ BIT, M2.6 X 8 S-NI	B1 B2-1 B2-2	3
3		ME11XCC001		BADGE.CYB		10	1
4		MU321LD001		TERMINAL BATT C		6	1
5		VB762SM007		REA CASE		2	1
6		VE42XAX001		FILTER		5	1
7		VL641SM001		BATTERY LID		3	1
8		VN110SP005		BUTTON		4-1 4-10 4-11 4-12	25
9						4-13 4-14 4-15 4-16	
10						4-17 4-18 4-19 4-2	
11						4-20 4-21 4-22 4-23	
12						4-24 4-25 4-3 4-4	
13						4-5 4-6 4-7 4-8	
14						4-9	
15		VS667MB002		SPONGE		8	1
16		VVSX2RC*E1		SER.NO.PLATE		9	1

EXPLODED ASSEMBLY	CYBERNET PART NAME: FRONT CASE ASSY	CYBERNET PART CODE: AMX2RC**01	CUSTOMER STOCK NO.				
ITEM	REMARKS	CYBERNET PART CODE	CUSTOMER'S PART, STOCK NUMBER	CYBERNET PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
1		MS765AKJJ7		ESCUTCHON			1
2		VB762SM006		FRONT CASE			1

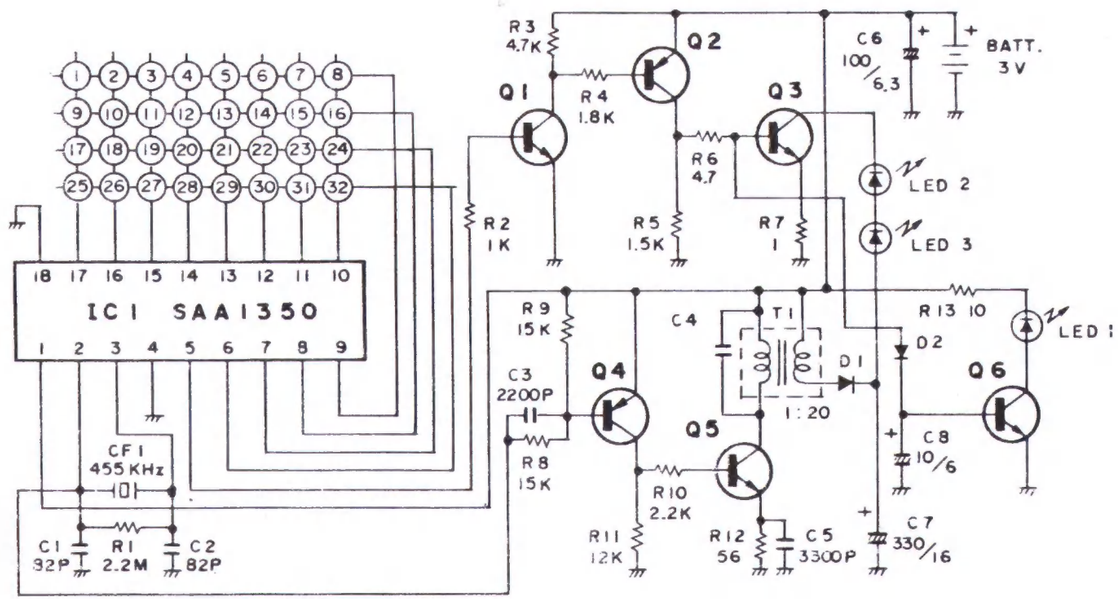
EXPLODED ASSEMBLY	PART NAME	PART CODE	
	P.W.BOARD ASSY	APSTX005AA	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		CCDB820K0M		CERAMIC CAP.	82PF 50V -10, +10% SL	C1	C2			2
2		CEAB101ADN		ELYT. CAPACITOR		C6				1
3		CEAD100ALX		ELYT. CAPACITOR	10MFD 16V	C8				1
4		CEAD331ADN		ELYT. CAPACITOR		C7				1
5		CQMB222KEH		MYLAR CAPACITOR	2200PF 50V -10, +10%	C3				1
6		CQMB332KEH		MYLAR CAPACITOR	3300PF 50V -10, +10%	C5				1
7		CX0455001M		CERAMIC OSC.		CX1				1
8		MW401CX001		SHORT JUMPER	JW-10					17
9		MW401CX003		SHORT JUMPER						1
10		MW401CX005		SHORT JAMPER	JW-15					2
11		PSTX005C0X		PRINTED W.BOARD						1
12		QDSMA150XN		SILICON DIODE	MA150 VF 1.2V,VR 35V NO-RANK 24MIN	D1	D2			2
13		QLBLN217RN		L.E.D.	LN217RP RED	LED1				1
14		QL1SE303AA		L.E.D.	SE303A RED 1.45V	LED2	LED3			2
15		Q20A1350AQ		I.C.	SAA 1350 REMOTE CONT. TX	U1				1
16		QTA0733XDA		TRANSISTOR	2SA733 P,Q-RANK	Q2	Q4			2
17		QTC0945AEA		TRANSISTOR	2SC945A P,Q-RANK	Q1	Q5	Q6		3
18		QTC1383XCN		TRANSISTOR	2SC1383 O,R-RANK	Q3				1
19		RD25PJ010X		CARBON FILM R.		R7				1
20		RD25PJ100X		CARBON FILM R.	0.25W 10 OHM 5%	R13				1
21		RD25PJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R2				1

EXPLODED ASSEMBLY	PART NAME	PART CODE	
	P.W.BOARD ASSY	APSTX005AA	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		RD25PJ123X		CARBON FILM R.	0.25W 12K OHM 5%	R11				1
2		RD25PJ152X		CARBON FILM R.	0.25W 1.5K OHM 5%	R5				1
3		RD25PJ153X		CARBON FILM R.	0.25W 15K OHM 5%	R8	R9			2
4		RD25PJ182X		CARBON FILM R.	0.25W 1.8K OHM 5%	R4				1
5		RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R10				1
6		RD25PJ225X		CARBON FILM R.	0.25W 2.2M OHM 5%	R1				1
7		RD25PJ4R7X		CARBON FILM R.	0.25W 4.7 OHM 5%	R6				1
8		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R3				1
9		RD25PJ560X		CARBON FILM R.	0.25W 56 OHM 5%	R12				1
10		SP01ABX36N		PUSH ON SWITCH.		S1	S10	S11	S12	25
11						S13	S14	S15	S16	
12						S17	S18	S19	S2	
13						S20	S21	S22	S23	
14						S24	S25	S3	S4	
15						S5	S6	S7	S8	
16						S9				
17		TR07BB001S		I.F T.		T1				1
18										
19										
20										
21		KPX2RC*E01		INNER CARTON						1

Schematic Diagram



(15) AUX	(14) PHONO	(13) TUNER		(16) TAPE I	
(10) AM/FM	(24) DOWN	(9) HOLD	(17) UP		(11) MW
(18) 1	(19) 2	(20) 3	(21) 4	(22) 5	(23) 6
(30) REC	(28) REW	(25) STOP	(27) PLAY	(29) F.F	(26) PAUSE
(4) POWER ON	(3) POWER OFF			(5) VOLUME ⊕	(6) VOLUME ⊖

Q1,5,6 2SC945
Q2,4 2SA733
Q3 2SC1383

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